Problem J: Shaking

The dinner party was getting out of control, with the candles all growing up to the ceiling, the bottles flying around using the plates as wings, and the soup–ladles walking up the table, when Alice decided she had had enough of it.

"I can't stand this any longer!" she cried, as she jumped up and seized the tablecloth with both hands: one good pull, and plates, dishes, guests, and candles came crashing down together in a heap on the floor.

"And as for you," she went on, turning fiercely upon the Red Queen, whom she considered as the cause of all the mischief —but the Queen was no longer at her side— she had suddenly dwindled down to the size of a little doll, and was now on the table, merrily running round and round.

"As for you," she repeated, catching hold of the little creature in the very act of jumping over a bottle which had just lighted upon the table, "I'll shake you into a kitten, that I will!"

Figure 1: Shaking the Red Queen

We will analyse the motion of the Red Queen when Alice started to shook her. We'll adopt a frame of reference such that the Queen's movement changes her position in only one direction, along the **Y** axis. Furthermore, the exact position **y** of the Queen at some time **t** is described by the following function:

$y(0) = 0$
$y(t) = \ln t \cdot \sin(t^{\frac{\pi}{2}}) \quad \text{for } t > 0$

The graph below illustrates the behaviour of this function for $t < 10$. Lower values of y mean that the Queen is closer to Alice, while a higher value of y means that the Queen is farther away from Alice.

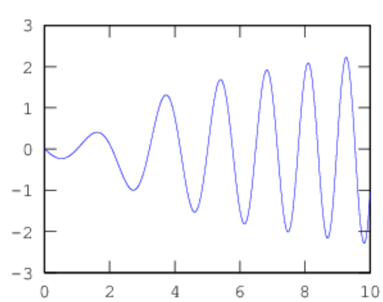

Figure 2: Position vs. Time

As you can see, Alice starts pulling back the Queen towards her from $t = 0$ to $t \approx 0.5$, and then pushes her away until $t \approx 1.6$. She continues with this oscillatory motion for some time.

Given a point in time **t**, you have to determine if at that moment the Queen is moving forward (away from Alice) or backward (towards Alice).

Input

Input starts with a positive integer **T**, that denotes the number of test cases ($T \leq 10000$).

Each test case is described in a single line that contains a real number **t**.

$0 < t < 100$

Every value of t will come with two digits after the decimal point. It is guaranteed that $y(t)$ will be monotonic in the range $(t - 10^{-3} : t + 10^{-3})$.

Output

For each test case, print the case number, and then print **forward** or **backward** depending on the movement of the Queen at time t.

Sample Input

```
3
0.30
6.72
50.00
```

Output for Sample Input

```
Case 1: backward
Case 2: forward
Case 3: forward
```